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Project Design

For a Geophysical Survey and Topographical Survey:

Land at Rhostyllen, Wrexham

Prepared for:

Innova Renewables Developments Ltd

Project No: 3056

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Contents

<i>Non Technical Summary</i>	3
1. Introduction	4
2. Site Description	5
3. Historical and Archaeological background	9
4. Objectives	13
5. Methodology for geophysical survey.....	14
5.2. Data processing and presentation	16
6. Methodology for Topographical Survey	17
6.1. General.....	17
6.2. Survey drawings.....	18
7. Monitoring	18
8. Post-fieldwork programme	19
8.1. Final reporting	19
8.2. Site archive	20
8.3. Report to Client.....	22
8.4. Additional Reports	22
8.5. Summary Reports for Publication.....	22
8.6. Notification of Important Remains	22
8.7. Archive Deposition.....	22
9. Resources and timetable	23
9.1. Standards.....	23
9.2. Staff	23
9.3. Equipment	23
9.4. Timetable of archaeological works	24
9.5. Insurance.....	24

9.6. Arbitration	24
10. Health and safety.....	24
11. References	25
11.1. Websites Consulted	26

Appendix 1: Data Management Plan

Appendix 2: Selection Strategy

Figures

- Figure 1. Site Location
- Figure 2. Proposed Development Plan
- Figure 3. Indicative HDD plans and profile
- Figure 4. Photo Location Plan
- Figure 5. Proposed Survey Areas

List of Plates

Plate 1: view west towards Offa's Dyke (DE137).

Plate 2: view south along recently re-cut ditch parallel to Offa's Dyke (DE137)

Plate 3: view east near possible southern Cable route across Offa's dyke (DE137).

Plate 4: view north along Offa's Dyke: Cadwgan Hall Section (DE132).

Plate 5: view east towards field gate across Offa's Dyke: Cadwgan Hall Section (DE132).

Non Technical Summary

This Project Design (PD) details the methodology for a geophysical survey and topographical survey to be undertaken on Land at Rhostyllen, Wrexham. The work is intended to inform the determination of a Scheduled Monument Consent Application associated with the construction of a 400kv high voltage power transmission cable between a proposed new Energy Storage System and substation at Rhostyllen to the west of Wrexham centred on SJ 29470 48398 and the existing Legacy Substation. The final route of this transmission line has not yet been determined, but there is the potential that it may need to cross a scheduled section of the Offa's Dyke Monument. The Cadw Inspector of Monuments for North Wales has requested archaeological research be undertaken into the current state of two sections of the monument in order to help determine any future application for Scheduled Monument Consent (SMC). The two sections of the monument are: DE194; Offa's Dyke: Section extending 120m from Railway to Bronwylfa Road, Legacy and DE132; Offa's Dyke: Cadwgan Hall Section, extending from River Clywedog to the Railway. It has been prepared by Archaeology Wales Ltd for Innova Renewables Developments Ltd, in support of a forthcoming planning application. The local planning authority is Wrexham County Borough Council.

The purpose of the proposed Desk Based Assessment and Site Visit is to provide information regarding the current state of the two sections of Offa's Dyke both above and below ground in order to provide Cadw with the information they need to determine an application for Scheduled Monument Consent.

All work will be undertaken in accordance with the Universal standards and guidance set by the Chartered Institute for Archaeologists (2023).

1. Introduction

- 1.1.1. This Project Design (PD) details the methodology for a programme of geophysical survey and topographical survey to be undertaken on Land at Rhostyllen, Wrexham. The work is intended to inform the determination of a future Scheduled Monument Consent Application associated with the construction of a 400kv high voltage power transmission cable between the proposed Energy Storage System and substation at Rhostyllen, to the west of Wrexham centred on SJ 29470 48398 and the existing Legacy Substation (Figures 1 and 2). The proposals are currently in the pre-planning application stage, the local planning authority is Wrexham County Borough Council (WCBC).
- 1.1.2. Whilst the current development proposal is currently being submitted, the final route of this transmission line has not yet been determined, but there is the potential that it may need to cross a scheduled section of the Offa's Dyke Monument. The Cadw Inspector of Ancient Monuments for North Wales has requested archaeological research be undertaken into the current state of two sections of the monument in order to help determine any future application for Scheduled Monument Consent (SMC). The two sections of the monument are: DE194; Offa's Dyke: Section extending 120m from Railway to Bronwyllfa Road, Legacy and DE132; Offa's Dyke: Cadwgan Hall Section, extending from River Clywedog to the Railway. Consultation with the Cadw Inspector of Ancient Monuments in North Wales dated 24/01/2024 confirmed the requirement for an archaeological Geophysical survey and topographic survey to be submitted in support of any future Scheduled Monument Consent application in order to assess the current state of the monument and provide Cadw with the information

they need to determine any such application. The results of the surveys may also inform the final approved route of the high voltage transmission line. Once the final route of the transmission line has been determined, scheduled monument consent will be required if it crosses a scheduled section of the monument. Further archaeological mitigation may be required at this stage and Separate Project Designs to cover these further mitigation stages will be produced and submitted to Cadw for approval in advance of commencement of each stage.

- 1.1.3. This WSI has been prepared by John Davey, Archaeology Wales Ltd (Henceforth - AW) at the request of Innova Renewables Developments Ltd. It provides information on the methodology that will be employed by AW during the surveys of the site. This WSI is to be approved by Cadw, prior to the survey being undertaken. A section 42 application may also be required prior to commencement of the survey.
- 1.1.4. All work will conform to the Standard and Guidance for Geophysical Survey (CIfA December 2020) and the Universal standards and guidance set by the Chartered Institute for Archaeologists (2023). All work will be undertaken by suitably qualified staff to the highest professional standards.

2. Site Description

- 2.1.1. The proposed development is currently being submitted. However, it is understood that it will comprise a high voltage (400kv) transmission line linking a proposed new Energy Storage System and substation at

Rhostyllen, west of Wrexham centred on SJ 29470 48398; and the existing Legacy substation to the west. Due to challenges associated with installing a cable of such high voltage, it is not possible to be certain of the exact final route at this stage. There remain three possible routes currently under consideration (Figure 2).

- 2.1.2. A 400Kv cable is three phases, so the corridor/construction requirements are much larger than a single phase 33kv cable.

The physical installation of a 400kV cable is within a 1.5m-2m wide trench within a 10m wide easement strip.

The transmission industry regularly use Horizontal Directional Drilling (HDD), including to cross obstacles such as rivers, SSSIs, railways, etc. This is a precision engineering technique and could be used to cross the line of Offa's Dyke and the Former Rhos Railway embankment.

If repairs are needed, cables can be pulled in and out of the HDD duct via launch pits which would be located outside of the scheduled area. So, there would be no need to vertically access the cable from above and disturb the monument in the future.

The Point of Connection (PoC) to Legacy substation is defined by the National Grid and the approach into it through their operational land and existing assets governs the route of the cable. The PoC is on northwest side of Legacy substation.

- 2.1.3. A great deal of work has already been undertaken in order to find a suitable route for the cable. A suggested route along the line of the railway embankment has proved impossible. Along the edge of the embankment there is already an existing 132kV cable underground as well as overhead line towers nearby. Furthermore, the entire

embankment has a Tree Preservation Order. Required clearances observing these constraints would not allow a cable route that passes through the unscheduled section of Offa's Dyke at the embankment.

Another suggested cable route along the B5097 is not possible because the gap in the scheduled section of Offa's Dyke is only 5m wide at this point. There is also an existing water main in the highway, leaving no space for the cable.

2.1.4. This leaves the three potential routes shown in Figure 2. However, it is not possible at this stage to be certain which of the three routes will ultimately prove feasible as further assessment needs to be completed on each. For this reason, a planning application is currently being submitted in which all three route options are retained. The northern route would cross the line of Offa's Dyke along the road to the north of Cadwgan Farm in an unscheduled section of the monument. However, the middle and southern options would cross the line of Offa's Dyke at a place where it is scheduled (DE132 & DE194 respectively) and would require Scheduled Monument Consent (Figure 1 and 2). It is proposed that only one of these options will eventually be developed.

2.1.5. The northern proposed route would run primarily via the road to the north of Cadwgan Farm. However, land ownership is with Highways and there is also competition for this route from other developers who need to install cables linking their developments with the Legacy Substation. Cooperative agreements are being sought but there is no guarantee that installing multiple cables in this narrow section is viable from an engineering perspective. There are also further constraints along this route due to a BT cable and water main.

- 2.1.6. The southern or middle proposed routes crossing Offa's Dyke may therefore become the only viable routes. It is anticipated that the best solution to protect the scheduled monument would be to utilise HDD under the line of both the former railway embankment and Offa's Dyke.
- 2.1.7. Indicative plans and drill profile show that drilling would be undertaken at a depth of c.4.5m with a HDD, assuming that Offa's Dyke is scheduled to a depth of 2.5m, and that the launch/reception pits would be located some 160m/40m either side of the Scheduled Area (Figure 3).
- 2.1.8. The proposed development area currently comprises mixed-use, irregular, hedged agricultural fields (plates 1-5; Figure 4).
- 2.1.9. The proposed survey area is gently undulating and crossed by the former Rhos Railway embankment which runs approximately E-W as well as the two scheduled sections of Offa's Dyke, which run approximately N-S. The section to the north of the former railway embankment: DE132 - *Offa's Dyke: Cadwgan Hall Section, extending from River Clywedog to the Railway*, extends within the proposed survey area for a distance of approximately 400m north of the railway embankment to the lane north of Cadwgan Farm. The section to the south DE194 - *Offa's Dyke: Section extending 120m from Railway to Bronwylfa Road, Legacy*, extends for approximately 110m south of the railway embankment to the B5097 Bronwylfa Road. It is likely that the construction of the Rhos Railway embankment c. 1900 caused significant disturbance to archaeological deposits within its curtilage.
- 2.1.10. The underlying geology for the site comprises Mudstone, siltstone and sandstone of the Pennine Lower Coal Measures Formation and Pennine Middle Coal Measures Formation - Sedimentary bedrock formed between 319 and 309.5 million years ago during the Carboniferous

period.

- 2.1.11. The bedrock is overlain by superficial deposits which comprise Devensian Till - Diamicton. A sedimentary superficial deposit formed between 116 and 11.8 thousand years ago during the Quaternary period.

3. Historical and Archaeological background

- 3.1.1. The wider proposed survey area contains three Scheduled Monuments: Offa's Dyke: Section extending 120m from Railway to Bronwylfa Road, Legacy (DE194); Offa's Dyke: Cadwgan Hall Section, extending from River Clywedog to the Railway (DE132); and Cadwgan Hall Mound (DE131).
- 3.1.2. The Scheduled Monument descriptions for both sections of Offa's Dyke are as follows:

Offa's Dyke is a boundary earthwork, believed to be of Early Medieval date running, with some gaps, for roughly 120km through the border area between modern Wales and England from Sedbury near Chepstow to Treuddyn in Flintshire. It is traditionally thought to have been built by the Mercian King Offa in the later 8th century, but recent excavations on a section near Chirk suggest that some sections may incorporate earlier earthworks. Whilst its exact function and original form are still the subject of debate Offa's Dyke is significant as the longest and one of the earliest surviving boundary monuments in Europe marking a nominal frontier between Saxon Mercia and Welsh kingdoms to

the west. It represents one of the great engineering achievements of the pre-industrial age and the most dramatic built structure to survive from the early medieval (c410-1100) period in Britain. Offa's Dyke is scheduled in multiple different sections on both sides of the present border. These display their own local physical characteristics but all share and contribute to the overall significance of the monument and have potential to enhance our knowledge of the monument as a whole. Approximately 80km of the monument coincides with the Offa's Dyke Path National Trail, which runs from Prestatyn to Sedbury.

The monument is of national importance for its potential to enhance our knowledge of early medieval defensive organisation and settlement. It retains significant archaeological potential, with a strong probability of the presence of associated archaeological features and deposits. A dyke may be part of a larger cluster of monuments and their importance can be further enhanced by their group value.

The scheduled area comprises the remains described and the areas around them within which related evidence may be expected to survive.

- 3.1.3. It is currently proposed that the cable trench may pass across the line of a scheduled section of Offa's Dyke. The linear earthwork is believed to have been constructed in the 8th century AD to define the western border of the Anglo-Saxon kingdom of Mercia. The monument comprises a linear defensive earthwork consisting of a stretch of bank, with a ditch on the western side. A counterscarp (raised bank) may be

visible on the west side of the ditch in places.

3.1.4. Later medieval activity is known from Cadwgan Hall immediately to the north of the proposed survey area and an associated mound: Cadwgan Hall Mound (DE131) thought to be the site of a motte and Bailey adjacent to Offa's Dyke.

3.1.5. The regional Historic Environment Record describes the section of Offa's Dyke within the proposed survey area as follows:

Imposing stretch of bank and ditch destroyed and damaged in places but generally in good condition. Height of bank varies but averages 2.2m.

3.1.6. A watching brief conducted by Clwyd Powys Archaeological Trust in 2002 observed the excavation of 4 trenches on the west side of the dyke, adjacent to the railway embankment (PRN 106595). Three of the trenches revealed deposits that could be interpreted as ditch fill (Owen, 2002).

3.1.7. Clwyd Powys Archaeological Trust carried out a heritage impact assessment for the site of a proposed new implement store at Cadwgan Hall, Bersham in 2016 (PRN 140135). The store would occupy the site of an existing feed silo at the north-west corner of the farmyard. The development plot lies adjacent to the scheduled area of the Cadwgan Hall Mound (SM DE 131) but it was not envisaged that there will be any significant impact on the monument or on the early medieval linear earthwork of Offa's Dyke (SM DE 132), which lies to its west. In part this is owing to the likelihood that any remains of the mound at this location are likely to have been removed when a building was constructed there in what is thought to have been the early 19th century. This building is

only evident on the historic mapping for the area and was demolished after 1873, but traces are still evident about 1m below the existing ground level of the development plot (Hankinson 2016).

- 3.1.8. In 2017 Scheduled Monument Consent was granted for the Rights of Way Department, Wrexham County Borough Council for two minor improvements to the existing public right of way on the line of listed sections of Offa's Dyke (DE132: Offa's Dyke: Cadwgan Hall Section, extending from River Clywedog to the Railway DE137: Offa's Dyke: Pentre-Bychan Hall Section, extending 540m S from BronWylfa), and a programme of dense scrub clearance on the line of the path running through the ditch of Offa's Dyke: Pentre-Bychan Hall Section, extending 540m S from Bron-Wylfa DE137 (PRN 125014). Various conditions were attached to the consent, but none requiring archaeological work (Cadw 2017 Scheduled Monument consent letter). A line search undertaken by the client as part of their feasibility assessments also indicates that a gas main and water duct cross scheduled sections of the monument nearby, although there is no readily available record of archaeological mitigation being undertaken at those times.
- 3.1.9. Archaeology Wales have recently carried out an archaeological Desk Based Assessment of the site (Davey & Muller 2023) and a stage 1 settings assessment (Davey 2023). The associated site visit revealed that both sections of the Offa's Dyke Scheduled Monument (DE132 & DE194) had suffered damage in relatively recent times through agricultural practices and drainage works. It is also likely that the construction of the Rhos Railway embankment c. 1900 caused significant disturbance to archaeological deposits within its curtilage. (plates 1-5; Figure 4).

- 3.1.10. Historic maps indicate the presence of Industrial activity in the area by the early 19th century. A coal pit is recorded on the Ordnance Survey surveyors' drawings of 1835 at Esclusham to the southwest of the wider study area. A disused railway also runs through the site from west to east. This represents a section of the GWR Legacy Branch line built between 1899 and 1912. The associated Legacy Station appears to have been constructed on the Legacy branch adjacent to the former coal pits (OS County Series 6 inch Denbighshire Sheet XXVIII.SW Revised: 1909 to 1910, Published: 1914).
- 3.1.11. The site lies within the landmap historic landscape area of Talwrn (WRXHMHL021) characterised as a rural environment of agricultural irregular fieldscapes.

4. Objectives

- 4.1.1. This Project Design sets out the methodology to ensure that the geophysical and topographical surveys will meet the standard required by The Chartered Institute for Archaeologists' *Standard and Guidance for archaeological geophysical survey (2020)* and the *Universal standards and guidance set by the Chartered Institute for Archaeologists (2023)*.
- 4.1.2. The primary objective of the geophysical work will be locate and describe, by means of geophysical survey, archaeological features that may be present within the development area. The proposed archaeological work will attempt to elucidate the presence of absence of archaeological material that might be affected by the scheme, in

particular its character, distribution, extent and relative significance.

4.1.3. The primary objective of the topographic survey is to increase our understanding of the current state of preservation of the two Scheduled sections of Offa's dyke that may be affected by any future proposals regarding the construction of the high voltage transmission line. The topographical survey will also provide a baseline record of the current state and extent of the monument that may assist in re-establishing the monument should it be physically impacted by any proposed works.

4.1.4. A report will be produced that will provide information which is sufficiently detailed to allow informed planning decisions to be made that can safeguard the archaeological resource. Sufficient desk-top research will be undertaken to ensure that the results of this work are properly understood, interpreted, and reported. The information could then be used to determine further archaeological investigation or appropriate mitigation strategies for any archaeological remains within the area to be implemented prior to or during the proposed development.

5. Methodology for geophysical survey

5.1.1. The area to be surveyed will include all of the accessible scheduled area as well as a 30m swathe either side to ensure that any subsurface or topographical features associated with the monument that may lie outside of the scheduled area are captured (see Figure 5). On-site adjustments may be required to avoid areas of magnetic interference

or inaccessibility, for example wire fencing, ponds, ditches or areas of dense undergrowth and steeper slopes which may prove unsuitable for survey. Care will be taken not to damage any unstable or vulnerable sections of the monument.

- 5.1.2. The site will be located by GPS. All survey points will be located with a total station or similar survey equipment and plotted onto an O.S. base map.
- 5.1.3. The on-site survey will be undertaken in a single phase. This will be followed by report production.
- 5.1.4. The survey will be carried out using a Bartington Grad601 Magnetometer. This is chosen as an efficient and effective method of locating archaeological anomalies on this type of site. The machine consists of two high stability fluxgate gradiometers suspended on a single frame, accurately aligned, that can detect localised magnetic anomalies compared with the general magnetic background. When mapped in a systematic manner this allows changes in the magnetic field resulting from differing features in the soil to be plotted. Strong magnetic anomalies will be generated by iron-based objects or areas of heat-activity, such as hearths and kilns. More subtle anomalies may be generated by changes, typically in the iron-oxide content, of underlying soils, compared to the natural subsoil. This helps to detect infilling material of features such as ditches and pits, as well as overlying material such as wall lines.
- 5.1.5. Relatively level fields of low pasture provide good locations for this type of survey. The surface of the field appears relatively uniform allowing rapid traverses and readings to be taken at consistent heights above the ground surface, and the upper ploughsoil is generally both neither deep enough to mask features cutting into the underlying subsoil, and unlikely to contain a significant amount of material that could interfere with the magnetic readings. The underlying geology appears unlikely to provide a strong magnetic response that could distort the readings. Areas of significant slopes would preclude safe surveying, as would areas of dense vegetation. A

previous site visits suggests that the monument itself is topped with a wire fence to the north of the railway embankment, and mature trees to the south. There is also a modern ditch on the west side of the southern section, enclosed by a wire fence. It will not be possible to survey within 5m of any wire fences due to magnetic interference, or within the areas of dense tree growth. However, these areas contain the upstanding earthwork bank which comprises the main physical remains of the monument and would be unlikely to produce meaningful geophysical survey results anyway due to the fact that the ground will comprise re-deposited bank material. This section of the monument will also be subject to topographical survey. The majority of the area either side of the bank should be available to geophysical survey.

- 5.1.6. Each survey area will be divided into 20m or 30m square grids along a common alignment. Within each grid, parallel traverses 1m apart will be walked at rapid pace along the same orientation. Instrument readings will be logged at 0.25m intervals, with an average cycle of 4 using an ST1 internal sample trigger. Incomplete survey lines resulting from irregular area boundaries or obstacles will be completed using the "dummy log" key.
- 5.1.7. Further survey information will be completed on the relevant pro-forma sheet. All data will be downloaded in the field into a laptop computer.

5.2. Data processing and presentation

- 5.2.1. Following completion of the detailed survey, a composite of the survey area will be created and processed using the software package *Terrasurveyor v.3*. After downloading, the results will be plotted in 2D.
- 5.2.2. The most typical method of visualizing the data is as a greyscale image. In a greyscale, each data point is represented as a shade of grey, from black to white at either extreme of the data range. A variety of processing tools (including destriping and possibly despiking) will be used to enhance any potential archaeology. The mean level of each traverse of data will be reduced to zero and all grids matched so that

there will be no differences between background levels. The data will be analysed using a variety of parameters and styles and the most useful of these will be saved as JPEG/TIFF images and displayed using Adobe Illustrator software.

- 5.2.3. The final results will be presented at an appropriate scale tied to the Ordnance Survey National Grid. A level of interpretation of these results will also be displayed.

6. Methodology for Topographical Survey

6.1. General

- 6.1.1. The work will be undertaken to meet the standards required by Historic England, *Understanding the Archaeology of Landscapes: a guide to good recording practice. 2nd Edition* (October 2017).
- 6.1.2. The location, extent and height of each asset will be recorded using a survey grade GNSS (also known as a GPS).
- 6.1.3. The Topographic Survey will include the following as a minimum for each asset:
- The type (classification of the archaeological field monument being investigated, and its period using the Thesaurus of Monument Types (Historic England 2014; <http://thesaurus.historicengland.org.uk/>).
 - The exact location of the site; the NGR and the Civil Parish, District, and County or Unitary Authority; along with identification numbers (NMR, SMR, HER, SAM) for the site.

- The name of the compiler, the date of the investigation and reason(s) for the survey, with details of site ownership and present land use.
- Consideration of the topographical setting of the monument and its relationship to other sites and landscapes, and to any historic features in the immediate vicinity.
- Relevant information from other sources, including published or unpublished accounts and oral information; the location of unpublished records must always be given. Relevant bibliographical references must be included, but an inclusive bibliography need not be assembled.

6.2. Survey drawings

6.2.1. The survey drawings will comprise:

- A plan showing the location and extent of the monument or landscape.
- A cartographic record, i.e., a metrically accurate site plan at a scale between 1:10 000 and 1: 500, showing the form of the site or landscape. The plans are to be related to topographical features and to modern detail whether or not they are depicted on OS maps.

7. Monitoring

- 7.1.1. Cadw will be contacted approximately one week prior to the commencement of site works, and subsequently once the work is underway.
- 7.1.2. Any changes to this PD that AW may wish to make after approval will

be communicated to Cadw for approval on behalf of the Planning Authority.

- 7.1.3. Cadw will be given access to the site so that they can monitor the progress of the work, they will be kept regularly informed about developments, both during the site works and subsequently during the post-fieldwork programme.

8. Post-fieldwork programme

8.1. Final reporting

- 8.1.1. Following a rapid review of the potential of the site archive, a programme of analysis and reporting will be undertaken.
- 8.1.2. This will result in the following inclusions in the report:
- A bilingual non-technical summary
 - The aims and methods adopted in the course of the archaeological works, and the background and circumstances of the report (including development proposals and planning background)
 - Location plan showing the area/s covered by the surveys
 - A written description and interpretation of all features and anomalies identified, including their character, function, potential dating, and relationship to adjacent features. Specialist descriptions and illustrations of all artefacts and soil samples will be included as appropriate. An indication of the potential of archaeological deposits which have not been disturbed by the development, and proposals for further necessary analysis.
 - The report will contain a discussion of the local, regional, and

national context of the remains by means of reviewing published reports, unpublished reports, historical maps, documents from local archives and the regional HER as appropriate.

- A detailed archive list at the rear listing all contexts recorded, all samples, finds and find types, drawings and photographs taken. This will include a statement of the intent to deposit, and location of deposition, of the archive.
- Conclusions as appropriate
- Bibliography
- A copy of the AW Specification

8.1.3. Copies of the report will be sent to the Client, and a copy of the report will be sent to Cadw for approval. Following approval, a copy will also be sent to the regional Historic Environment Record. Digital copies will be provided in pdf format if required.

8.1.4. The report and all relevant information will be submitted to the Historic Environment Record following the guidelines and procedures laid out in the *Guidance for the Submission of Data to the Welsh Historic Environment Records* (WAT 2018).

8.1.5. A summary report of the work will be submitted for publication to a national journal no later than one year after the completion of the work.

8.2. Site archive

8.2.1. An ordered and integrated site archive will be prepared in accordance with: Management of Research Projects in the Historic Environment (MoRPHE) (2015) upon completion of the project.

8.2.2. The site archive – including all paper, and digital records – will be

subjected to selection in order to establish those elements that will be retained for long term curation. The selection strategy will be agreed with all stakeholders and will be detailed in the Data Management Plan (CIfA 2020). It will be developed taking into consideration the aims and objectives of the project and will be informed through a detailed consideration of the Research Agenda of the Archaeology of Wales and other relevant research frameworks. The manner in which the records will be prepared for long time storage will be guided by the requirements established by the repositories. A detailed justification for the disposal of both records and materials will be written and included within the Data Management Plan.

- 8.2.3. The final archive (site and research) will be prepared in accordance with the National Monuments Record (Wales) agreed structure and deposited with an appropriate receiving organisation, in compliance with CIfA Guidelines (Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives, 2014). It will also conform to the guidelines set out in The National Standard and Guidance to Best Practice for Collecting and Depositing Archaeological Archives in Wales (National Panel for Archaeological Archives in Wales 2017). The legal landowner's consent will be gained for deposition of finds. The project will adhere to the Welsh Archaeological Trust's joint Guidance for the Submission of Data to the Welsh Historic Environment Records (2018).
- 8.2.4. Copies of all reports, the digital archive and an archive index will be deposited with the National Monuments Record, RCAHMW, Aberystwyth. A high-resolution pdf copy of the report will be deposited with Cadw.

8.3. Report to Client

- 8.3.1. Copies of all reports associated with the mitigation, together with inclusion of supporting evidence in appendices as appropriate, including photographs and illustrations, will be submitted to the Client.

8.4. Additional Reports

- 8.4.1. After an appropriate period has elapsed, copies of all reports will be deposited with the relevant county Historic Environment Record and the National Monuments Record. The report and all relevant information will be submitted to the Historic Environment Record following the guidelines and procedures laid out in the Guidance for the Submission of Data to the Welsh Historic Environment Records (WAT 2018).

8.5. Summary Reports for Publication

- 8.5.1. Short archaeological reports will be submitted for publication in relevant journals; as a minimum, a report will be submitted to the annual publication of the regional CBA group or equivalent journal.

8.6. Notification of Important Remains

- 8.6.1. Where it is considered that remains have been revealed that may satisfy the criteria for statutory protection, AW will submit preliminary notification of the remains to Cadw.

8.7. Archive Deposition

- 8.7.1. Although there may be a period during which client confidentiality will need to be maintained, copies of all reports and the final archive will be deposited no later than 12 months after completion of the work.
- 8.7.2. Copies of all reports, the digital archive and an archive index will be

deposited with the National Monuments Record, RCAHMW, Aberystwyth. A full Data Management Plan for this project is included in Appendix I.

- 8.7.3. Wherever the archive is deposited, this information will be relayed to the HER.

9. Resources and timetable

9.1. Standards

- 9.1.1. AW works to the standards and guidance provided by the *Chartered Institute for Archaeologists*. AW fully recognise and endorse the Chartered Institute for Archaeologists' *Code of Conduct*, *Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology* and the *Standard and Guidance for archaeological geophysical survey* currently in force. All employees of AW, whether corporate members of the Chartered Institute for Archaeologists or not, are expected to adhere to these Codes and Standards during their employment.

9.2. Staff

- 9.2.1. The project will be undertaken by suitably qualified AW staff. Overall management of the project will be undertaken by John Davey PhD MCIfA, AW Senior Project Manager.

9.3. Equipment

- 9.3.1. The geophysical survey will use a Bartington Grad601 set to standard specifications.
- 9.3.2. The topographical survey will use a survey grade GNSS (also known as

a GPS).

9.4. Timetable of archaeological works

- 9.4.1. The work will be undertaken soon after approval of this PD and on receipt of any other relevant statutory notices and licences such as approval of a Section 42 application. AW will notify Cadw of the start date.

9.5. Insurance

- 9.5.1. AW is fully insured for this type of work and holds Insurance with Aviva Insurance Ltd and Hiscox Insurance Company Limited through Towergate Insurance. Full details of these and other relevant policies can be supplied on request.

9.6. Arbitration

- 9.6.1. Disputes or differences arising in relation to this work shall be referred for a decision in accordance with the Rules of the Chartered Institute of Arbitrators' *Arbitration Scheme for the Institute for Archaeologists* applying at the date of the agreement.

10. Health and safety

- 10.1.1. Prior to the commencement of work AW will carry out and produce a formal Health and Safety Risk Assessment in accordance with *The Management of Health and Safety Regulations* 1999. A copy of the risk assessment is attached, and a copy will be kept on site and be available for inspection on request. A copy will be sent to the client (or their agent as necessary) for their information. All members of AW staff will adhere to the content of this document.

- 10.1.2. AW will adhere to best practice with regard to Health and Safety in Archaeology as set out in the FAME (Federation of Archaeological Managers and Employers) health and safety manual *Health and Safety in Field Archaeology (2002)*.

11. References

Chartered Institute for Archaeologists, 2019. Toolkit for Selecting Archaeological Archives.

Chartered Institute for Archaeologists, 2020. Standards and guidance for the creation, compilation, transfer and deposition of archaeological archives.

Chartered Institute for Archaeologists, 2020. Standards and guidance for the collection, documentation, conservation and research of archaeological materials.

Chartered Institute for Archaeologists. 2020. Standard and guidance for archaeological geophysical survey.

Davey, J. & Muller, J. 2023. Archaeological Desk Based Assessment On Land at Rhostyllen, Wrexham; February 2023. Archaeology Wales Report No. 2162.

Hankinson, R. 2016. Cadwgan Hall, Bersham: Heritage Impact Assessment CPAT Report No. 1450

National Panel for Archaeological Archives in Wales (NPAAW), 2019. The National Standard and Guidance to Best Practice for Collecting and Depositing Archaeological Archives in Wales

Owen, W. G. 2002. Offa's Dyke, Legacy, Wrexham. Archaeological Watching Brief CPAT report 453

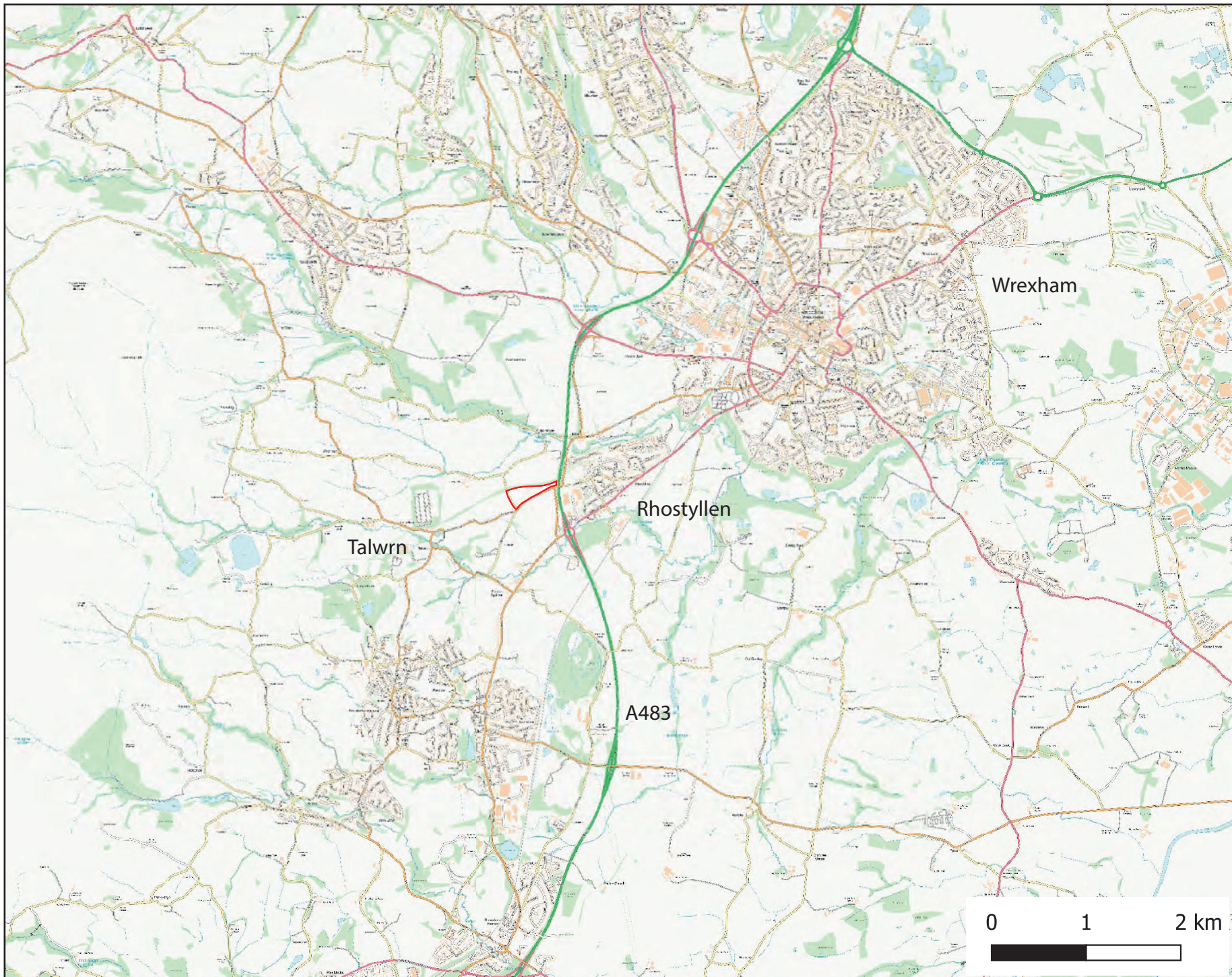
The Welsh Archaeological Trusts (WAT). October 2022. Guidance for the Submission of Data to the Welsh Historic Environment Records.

11.1. Websites Consulted

British Geological Survey: Geology of Britain viewer:

www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html Accessed 25/01/2024

National Library of Scotland Maps: <https://maps.nls.uk/> Accessed 25/01/24



Proposed
location of the
Rhostyllen
Battery
Storage
Facility

Figure 1: Location Plan

The Ordnance Survey has granted
Archaeology Wales Ltd a Copyright
Licence (No. 100055111) to
reproduce map information;
Copyright remains otherwise with
the Ordnance Survey

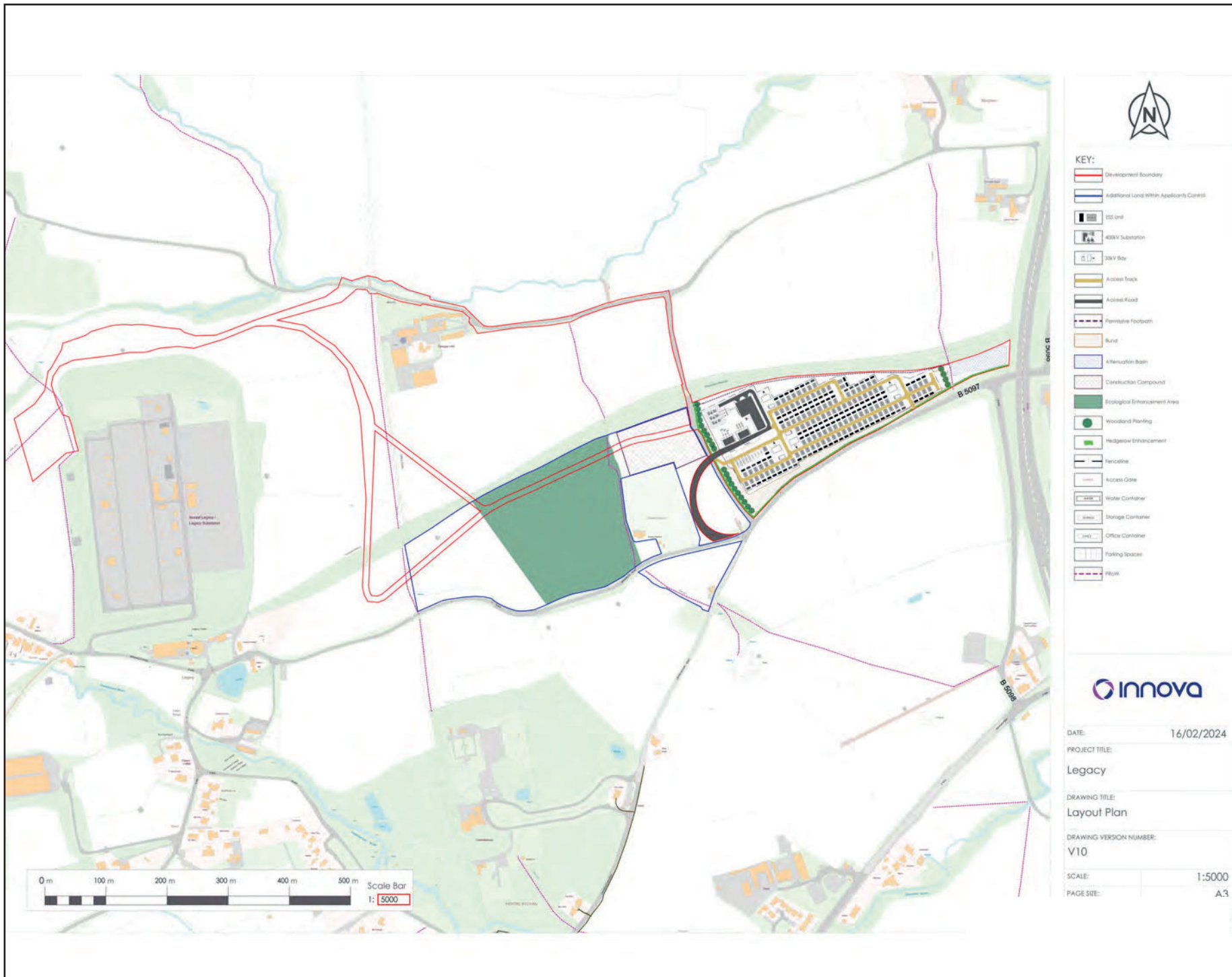


Figure 2: Proposed Development Layout Plan

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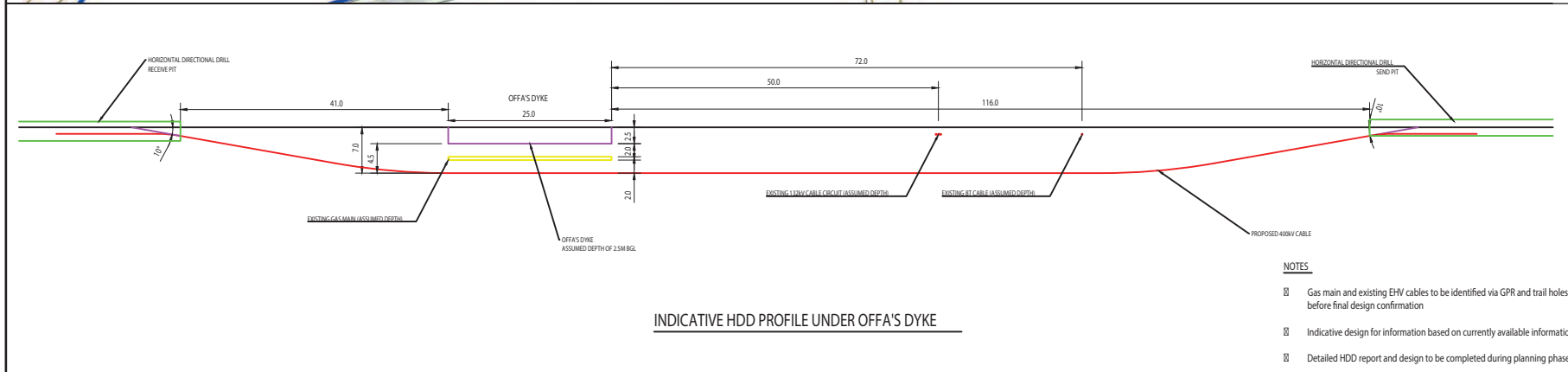
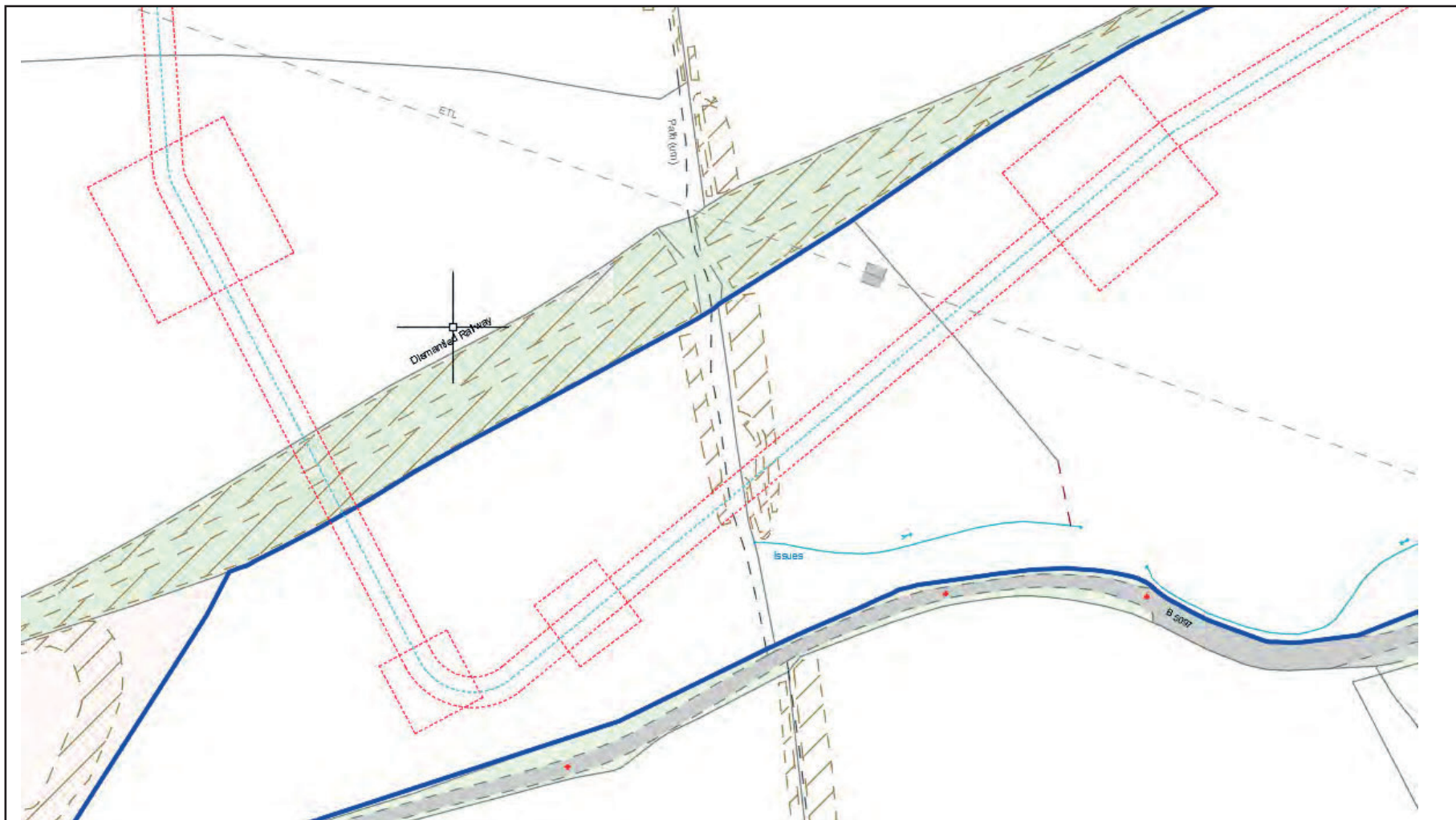


Figure 3: Indicative HDD Plan and Profile.

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey

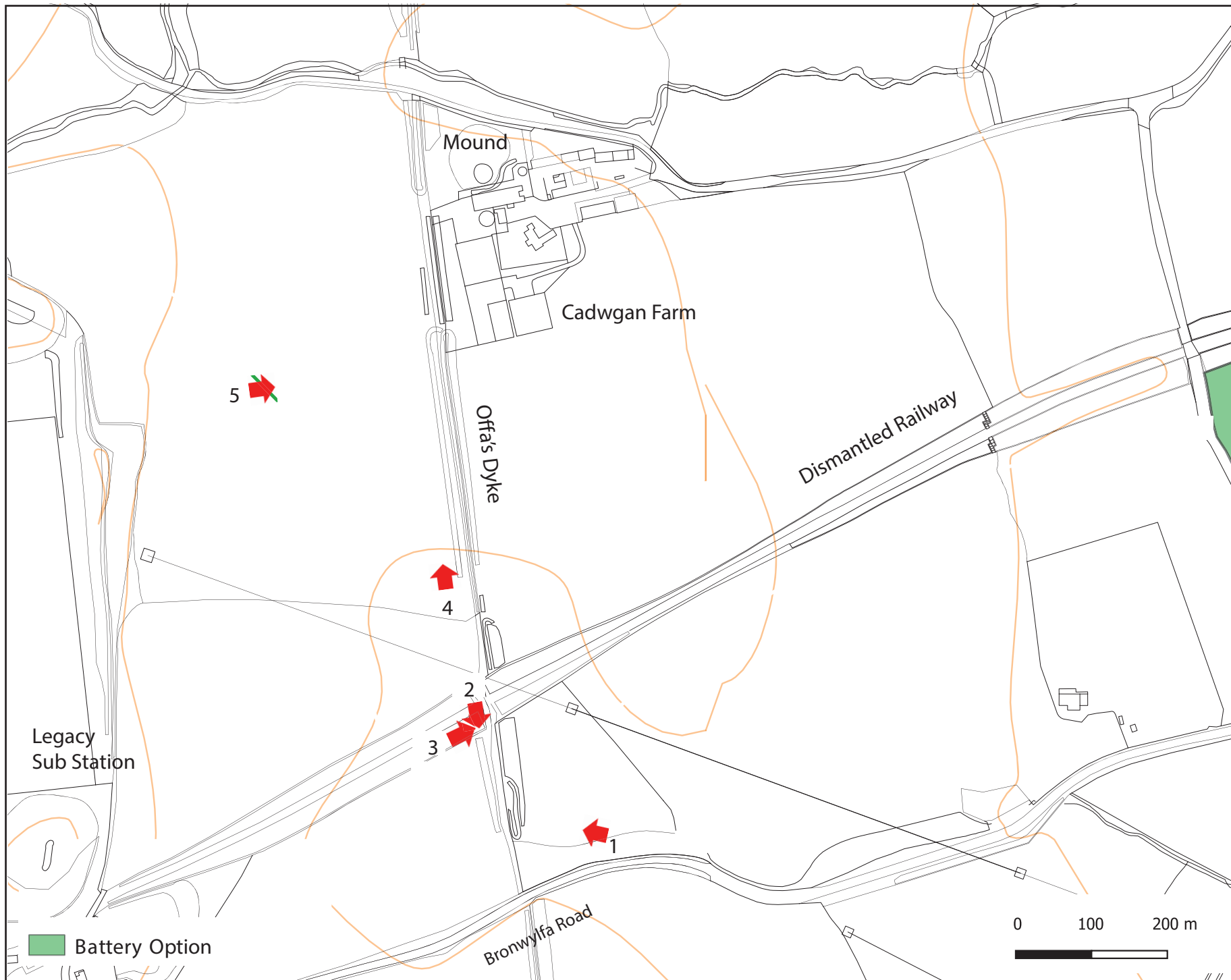
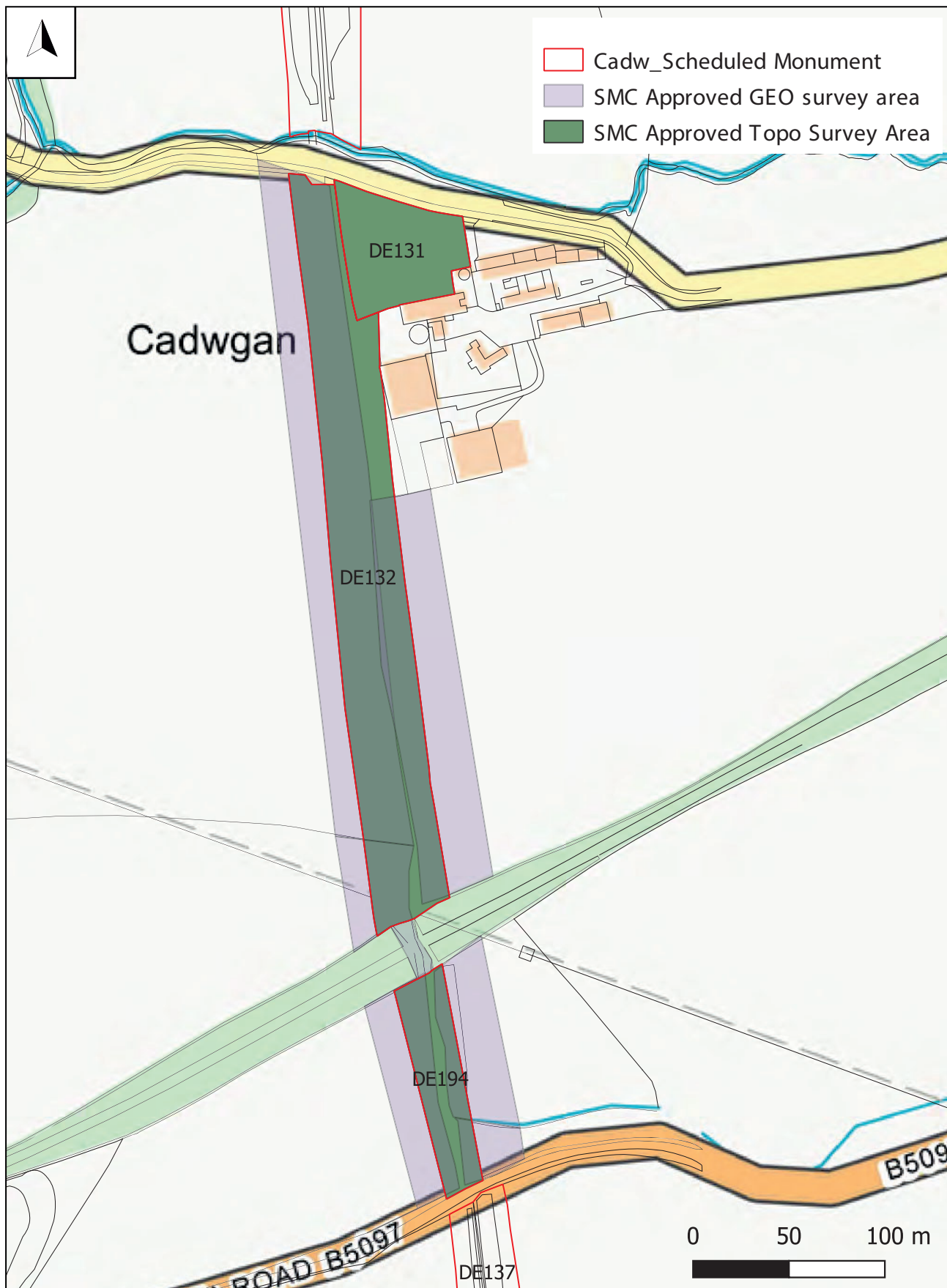


Figure 4: Photo Location Plan

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey



The Ordnance Survey has granted
Archaeology England Ltd a

Licence (No. 100055111) to
reproduce map information;
Copyright remains otherwise with
the Ordnance Survey

Figure 5: Proposed Survey Areas



Plate 1: view west towards Offa's Dyke (DE137).



Plate 2: view south along recently re-cut ditch parallel to Offa's Dyke (DE137)



Plate 3: view east near possible southern Cable route across Offa's dyke (DE137).



Plate 4: view north along Offa's Dyke: Cadwgan Hall Section (DE132).



Plate 5: view east towards field gate across Offa's Dyke: Cadwgan Hall Section (DE132).

Archaeology Wales

APPENDIX I: Data Management Plan

Data Management Plan

Section 1: Project Administration

Project ID
• AW Project No: 3056 - Rhostyllen, Wrexham • AW Site Code: RBW/24/GEOTS
Project Name
Rhostyllen, Wrexham, Geophysical and Topographic Survey
Project Description
A programme of geophysical survey and topographical survey to be undertaken on Land at Rhostyllen, Wrexham. The work is intended to inform the determination of a future Scheduled Monument Consent Application associated with the construction of a 400kv high voltage power transmission cable between the proposed Energy Storage System and substation at Rhostyllen, to the west of Wrexham centred on SJ 29470 48398 and the existing Legacy Substation. The Cadw Inspector of Ancient Monuments for North Wales has requested archaeological research be undertaken into the current state of two sections of Offa's Dyke in order to help determine any future application for Scheduled Monument Consent (SMC). The two sections of the monument are: DE194; Offa's Dyke: Section extending 120m from Railway to Bronwylfa Road, Legacy and DE132; Offa's Dyke: Cadwgan Hall Section, extending from River Clywedog to the Railway.
Project Funder / Grant reference
Funder of Project: Innova Renewables Developments Ltd
Project Manager
John Davey PhD MCIfA (AW Senior Project Manager)
Principal Investigator / Researcher
Suitably Qualified and experienced AW staff
Data Contact Person
John Davey PhD MCIfA (AW Senior Project Manager)
Date DMP created
2/02/2024
Date DMP last updated
Version
v1
Related data management policies
This DMP is guided by the Project Brief, ClfA Standards and guidance, trusted digital repository guidelines (RCAHMW) or other best practice guidance (see brief for details)

Section 2: Data Collection

What data will you collect or create?

The table below provides a summary of the data types, formats and estimated archive volume for data collected / created as part of this project. As the project progresses, more detail regarding files will be added to this DMP.

Type	Format	Estimated volume (Data Archived)
Spreadsheets	Excel (.xlsx)	
Text/documents	Word (.docx) PDF (.pdf and .pdf/a)	
Images	Photographs (.jpg) Scanned drawings (.pdf)	
GIS	Shapefiles (.shp plus associated files)	
Geophysics	The geophysical survey data will be stored as raw data (.xml/.asci) and raster plots (.jpeg/.tif/.png/.pdf) including composites of each detailed survey area.	
GPS	GPS survey data will be stored both as raw data (text file/csv) and as shapefiles (.shp). This will include a polygon showing the limits of the development area. The database generated with GIS will be stored so it is accessible by future users.	

How will the data be collected or created?

Data Standards / Methods

- Standard methods of data collection will be applied throughout the project, working to best practice guidance where applicable / available. In general, data acquisition standards are defined against RCAHMW Guidelines. Specific or additional guidance relevant to this project are listed below, and will
- be updated as the project progresses.
- Methods of collection are specified within the Project Design (Davey 2024) and will meet the requirement set out in the Project Brief, the organisation recording manual and relevant CifA Standards and guidance.
- Where appropriate, project contributors external to the organisation will be required to include data standards, collection methodology and metadata with individual reports and data.
- Specific guidance:

Chartered Institute for Archaeologists. 2020. Standard and guidance for archaeological geophysical survey.

The Welsh Archaeological Trusts (WAT). October 2022. Guidance for the Submission of Data to the Welsh Historic Environment Records.

Data storage / file naming

- The data produced will be uploaded at regular intervals during the project as a way of backing up the information.
- The working project archive will be stored in a project specific folder on the internal organisational server. The internal organisation server is backed up to a cloud based storage system to maintain an up to date security copy of the organisation wide data.
- Project folders are named following established organisational procedures and the folder hierarchy and organisation devised will be understood by all members of staff involved in the project.
- Data collected will be downloaded and raw data will be stored in the appropriate folder.
- File naming conventions following established organisational procedures, based on RCAHMW file naming guidance, and include version control management.
- The data stored will be checked by the project manager regularly as a means of quality assurance.

Section 3: Documentation and metadata

What documentation and metadata will accompany the data?

- Data collected will include standard formats which maximise opportunities for use and reuse in the future (see Section 2, above).
- A RCAHMW metadata document will be included with the digital archive and include all data types included within the archive. A working copy will be kept on the organisational server in the Project Folder. A copy of the form containing HER required data will also be created.
- Data documentation will meet the requirement of the Project Brief, Museum Deposition Guidelines, Digital Repository Guidelines and the methodology described in the Project Design methodology.
- An archive catalogue documenting both physical and digital archive products will be maintained and submitted with both the Museum and Trusted Digital Repository

Section 4: Ethics and legal compliance

How will you manage any ethical, copyright and Intellectual Property Rights (IPR) issues?

- The project archive will include the names and contact details of individuals who intend to volunteer or participate in the excavation and post excavation stages. We have a GDPR compliant Privacy Policy which underpins the management of personal data; any personal data is managed through a secure cloud-based database and not retained on the project specific folders.
- Personal data will be removed from the archaeological project archive and permission to include individual's names in any reporting is gained prior to use.
- Copyright for all data collected by the project team belongs to the organisation, and formal permission to include data from external specialists and contractors is secured on the engagement of the specialist or contractor.

- Where formal permissions and/or license agreements are linked to data sharing, they will be included in the project documentation folders and will accompany the archaeological project archive.

Section 5: Data Security: Storage and Backup

How will the data be stored, accessed and backed up during the research?

- Organisational IT is managed by an external data management provider, who is also responsible for the management and verification of our daily back-ups and who supports access to security copies as needed
- Sufficient data storage space is available via the organisational server, which includes permissions-based access. The server is accessible by staff on and offsite through a secure log-in
- Off-site access to the project files on the organisation's server is provided to support back-up of raw data while fieldwork is ongoing. Where internet access for data back up is not possible, the raw data will be backed up to a separate media device (such as laptop and portable external hard drive).
- Project files will be shared with external specialists and contractors directly using the same system, with the wider project team gaining access to only the files needed using permissions-based access

Section 6: Selection and Preservation

Which data should be retained, shared, and/or preserved?

- The Selection Strategy and DMP will be reviewed and updated as part of the Post Excavation Assessment and Updated Project Design, and following full analysis. Updated documentation will be included in all reporting stages.
- Prior to deposition, the Selection Strategy and DMP will be updated and finalised in agreement with all project stakeholders (including the Local Planning Archaeologist, Client, Museum, RCAHMW).
- Selection will be informed by the Project Design, defined against the research aims, regional and national research frameworks, specialist advice and the significance of the project results.
- The project will be published as an online technical report (accessible via RCAHMW and as part of this the archive), with full access to research data.
- The project results are likely to provide new research data which can be included in the Historic Environment Record and will contribute to the knowledge of the early medieval period at The Site, and aiding the future management of the archaeological site.
- The data archive will be ordered, with files named and structured in a logical manner, and accompanied by relevant documentation and metadata, as outlined in Sections 2 and 3 of this DMP.
- Deselection will be undertaken automatically on any duplicate or unusable files, such as blurry or superfluous photographs.

What is the long-term preservation plan for the dataset?

- The digital archive will be deposited with the RCAHMW, which is working towards becoming a certified repository with Core Trust Seal.

The archive will be prepared for deposition by the project team and the costs for the time needed for preparation, and the cost of deposition have been included in the project budget.
Have you contacted the data repository?
The NMR at the RCAHMMW has been contacted during project initiation and confirmed that they will be the intended repository for digital data.
Have the costs of archiving been fully considered?
A costing estimate has been produced to allow for the preparation of the archive and has been included in the project budget.

Section 7: Data Sharing

How will you share the data and make it accessible?
- The museum and digital archive repository, and will be updated as the project progresses. - The investigations are likely to result in a number of documents: Project Design, Survey Report and Updated Project Design, Journal submission. - The final report is expected to be completed within 12 months of the completion of fieldwork. - A final version of the project report will be supplied to the Historic Environment Record, and any data which they request can also be provided directly. - The location (s) of the final Archaeological Archive will be included in the final report
Are any restrictions on data sharing required?
- A temporary embargo may be required on the sharing of the project results. If this is the case, specific details once agreed will be included in the updated version of this DMP and will be documented in the overarching Project Collection Metadata. - Data specific requirements, ethical issues or embargos which are linked to particular data formats will be documented within the relevant metadata tables accompanying the project archive

Section 8: Responsibilities

Who will be responsible for implementing the data management plan?
--

- The Project Manager and Post Excavation Manager will be responsible for implementing the DMP, and ensuring it is reviewed and revised at each stage of the project.
- Data capture, metadata production and data quality is the responsibility of the Project Team, assured by the Project Manager and Post Excavation Manager.
- Storage and backup of data in the field is the responsibility of the field team.
- Once data is incorporated into the organisations project server, storage and backup is managed by an external company.
- Data archiving is undertaken by the project team under the guidance of the Post Excavation Manager, who is responsible for the transfer of the Archaeological Project Archive to the agreed repository.
- Details of the core project team can be found in the Project Design.

Archaeology *Wales*

APPENDIX II: Selection Strategy

3056 - Rhostyllen, Wrexham

February 2024

Selection Strategy

Project Information

Project Management		
Project Manager	John Davey	
Archaeological Archive Administrator	Rhiannon Philp (PXM)	
Organisation	Archaeology Wales	
Stakeholders		
Collecting Institution(s)	NMR (RCHMW)	
Project Lead / Project Assurance	John Davey	
Landowner / Developer	Innova Renewables Developments Ltd	
Other		

Resources

Resources required

Describe the resources required to implement this Selection Strategy, particularly if unusual resources are required.

No unusual resources required outside of AW normal operating equipment and personnel.

Context

Describe below the context of this Selection Strategy. You should refer to:

- The aims and objectives of the project;
- Local Authority guidance (including the brief);
- Research Frameworks;
- The repository collection development policy and/or deposition policy;
- Material-specific guidance documents.

Note: This section may be copied from your Project Design/WSI to ensure all Stakeholders receive this context information.

A programme of geophysical survey and topographical survey to be undertaken on Land at Rhostyllen, Wrexham. The work is intended to inform the determination of a future Scheduled Monument Consent Application associated with the construction of a 400kv high voltage power transmission cable between the proposed Energy Storage System and substation at Rhostyllen, to the west of Wrexham centred on SJ 29470 48398 and the existing Legacy Substation.

The Cadw Inspector of Ancient Monuments for North Wales has requested archaeological research be undertaken into the current state of two sections of Offa's Dyke in order to help determine any future application for Scheduled Monument Consent (SMC). The two sections of the monument are: DE194; Offa's Dyke: Section extending 120m from Railway to Bronwylfa Road, Legacy and DE132; Offa's Dyke: Cadwgan Hall Section, extending from River Clywedog to the Railway.

All data will be digital borne, no physical archive expected.

The repository identified for the digital archive is the NMR via the RCHMW. Deposition will follow the guidelines provided by the repository and also any input from relevant finds specialists.

1 – Digital Data

Stakeholders

Name the individual(s) responsible for the Digital Data Selection decisions (i.e. Archaeological Archive Manager, Project Manager, Collections Curator).

Rhiannon Philp (PXM); John Davey (PM)

Selection

Location of Data Management Plan (DMP)

Selection of digital data elements should be considered in your project's DMP. For the purpose of the Selection Strategy, you can either copy the selection section of your DMP below, or attach it as an appendix to this document. Please indicate here if the DMP is attached.

See DMP in Appendix

The selection strategy in your DMP should:

- 1.1 Define what digital data will be selected for inclusion in the archaeological archive, how this will be done, and why. Do not forget to consider that specialists may have digital data that should be included in the archaeological archive.
- 1.2 Identify the selection review points during the project (i.e. project planning, data gathering, analysis and reporting and archive compilation).
- 1.3 Reference all relevant standards, policies or guidelines (e.g. digital repository deposition requirements) and specialist advice sought.
- 1.4 Identify any selection decisions that differ from standard guidelines and explain why.

See DMP in Appendix

De-Selected Digital Data

The procedure for dealing with De-selected digital data and what specialist advice informed this process should be recorded in your DMP. Please copy this information here or attach your DMP as an appendix to this document.

See DMP in Appendix

Amendments

Detail any amendments to the above selection strategy here.

Date	Amendment	Rationale	Stakeholders

2 – Documents

Stakeholders

Name the individual(s) responsible for the Documents Selection decisions (i.e. Archaeological Archive Manager, Project Manager, Repository Representative).

Rhiannon Philp (PXM); John Davey (PM)

Selection

Describe your Selection Strategy for the Documents elements of the archaeological archive. To do this you must:

- 2.1 Define which documents will be selected for inclusion in the archaeological archive, how this will be done, and why. Do not forget to consider that specialists may have documents that should be included in the archaeological archive.
- 2.2 Identify the selection review points during the project (e.g. project planning, data gathering, analysis and reporting and archive compilation).
- 2.3 Reference all relevant standards, policies or guidelines (e.g. digital repository deposition requirements) and specialist advice sought.
- 2.4 Identify any selection decisions that differ from standard guidelines and explain why.

2.1 No physical documents will be selected as per the deposition guidelines of the RCHMW. Instead a full digital copy of the paper archive will be made and the archive deposited with the NMR.

2.2 Selection reviews will be undertaken after the following phases: Fieldwork, Assessment, Analysis (if required), Archive Completion

2.3 Relevant Standards and Guidance:

CifA. 2020. Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials

2.4 It is not envisaged that the selection decisions will deviate from standard guidelines

De-Selected Documents

Describe the procedure for dealing with De-selected material and what specialist advice has informed this procedure.

All paper archive will be deselected due to reasons stated in section 2.1 above. AW will hold the paper archive until the digital version of the archive is confirmed as having been accepted by the NMR.

Amendments

Detail any amendments to the above selection strategy here.

Date	Amendment	Rationale	Stakeholders

3 – Materials

Note: This step should be completed for each material component of the archaeological archive. Copy this table for the various materials as required, providing the 'Material Type' and a section identifier (eg. '3.1') for each.

Material type	N/A no archaeological material was recovered.	Section 3.	
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Stakeholders

Name the individual(s) responsible for the Materials Selection decisions (i.e. Archaeological Archive Manager, Project Manager, Repository Representative).

Rhiannon Philp (PXM); John Davey (PM)

Selection

Describe your Selection Strategy for each material type and or object type. To do this you must:

- 3.1 State the Selection Strategy you are applying to each category of material, how this will be done, and why.
- 3.2 Identify the selection review points during the project (e.g. project planning, data gathering, analysis and reporting and archive compilation).
- 3.3 Reference all relevant standards, policies or guidelines (e.g. thematic, period, and regional, Research Frameworks, repository deposition policies) and specialist advice sought.
- 3.4 Identify any selection decisions that differ from standard guidelines and explain why.

The [Materials Selection Template](#) may be useful in structuring this section.

3.1 All artefacts are returned to Archaeology Wales' Finds and Environmental processing facility and dealt with in accordance with the professional standards set in the Chartered Institute for Archaeologists' Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials (2020).

Selection may also be made prior to deposition based on Society of Museum Archaeologists' *Selection, Retention and Dispersal of Archaeological Collections* guidelines (1993) and consultation of the receiving institution's deposition guidelines.

3.2 Selection reviews will be undertaken after the following phases: Fieldwork, Assessment, Analysis (if required), Archive Completion

3.3 Relevant Standards and Guidance:

Cifa. 2020. Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials

Historic England. 2014. Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation (second edition)

Society of Museum Archaeologists. 1993. *Selection, Retention and Dispersal of Archaeological Collections*

3.4 It is not envisaged that the selection decisions will deviate from standard guidelines

Uncollected Material

If you are practising selection in the field, describe the process that will be applied. To do this you must:

- Detail how you will characterise, quantify and record all uncollected material on site.
- Explain how you will dispose of, or re-distribute, uncollected material.

N/A

De-Selected Material

Describe what you will do with the de-selected material. All processed material should have been adequately recorded before de-selection.

N/A

Amendments

Detail any amendments to the above selection strategy here.

Date	Amendment	Rationale	Stakeholders

Materials Selection Template

This table may be inserted into Section 3 of the main [Selection Strategy Template](#) to help present differing selection strategies for different material types

Find Type	Selection Strategy	Stakeholders	Review Points

Archaeology Wales Limited

Main Office, Unit D11.6 Treforest Industrial Estate
Pontypridd - CF37 5UR

Tel: +44 (0) 1686 440371

Email: admin@arch-wales.co.uk

Web: arch-wales.co.uk